Canada Oil and Gas Lands Administration
Administration du pétrole et du gaz des terres du Canada

Geophysical Surveys on Canada Lands

Guidelines for Approvals and Reports

Ottawa, Canada

JANUARY, 1983

Department of Energy, Mines and Resources
Ministère de l'Énergie, des Mines et des Ressources

Department of Indian Affairs and Northern Development
Ministère des Affaires indiennes et du Nord canadien

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1. INTRODUCTION

This publication is designed to provide operators with guidelines for program approval and reporting requirements for geophysical/geological exploratory work conducted on Canada lands. It replaces the Energy, Mines and Resources publication "Offshore Geophysical Surveys" and the geophysical/geological reporting guidelines issued by the Department of Indian and Northern Affairs.

The booklet "Offshore Exploration" is recommended as a reference publication for all activities pertaining to exploration in the eastcoast offshore region. It outlines the responsibilities and requirements of federal departments and agencies concerned with the offshore and notes some of their services; lists persons who may be contacted for assistance; provides a summary of exploratory work done to date, and lists released geophysical/ geological reports to April 1979.

Either of the publications mentioned above are available free of charge, from:

Engineering Branch
Canada Oil and Gas Lands Administration
355 River Road
Ottawa, Ontario
K1A 0E4

The offices of the Canada Oil and Gas Lands Administration are located at:

Tower "B", Place Vanier
355 River Road
Vanier, Ontario

Telephone Number : (613) 993-3760

Telex Number : 053-4366,
Answerback: EMR RMB OTT

Telecopier Number: 993-9897

2. JURISDICTION

The Canada Oil and Gas Lands Administration administers federal regulatory authority on Canada lands pertaining to oil and gas exploration, production and development on behalf of the Department of Indian and Northern Affairs and the Department of Energy, Mines and Resources. Canada lands include the Yukon Territory, the Northwest Territories, Sable Island, Hudson Bay and those offshore areas adjacent to the coast of Canada which extend throughout the natural prolongation of Canada to the outer edge of the continental margin or to a distance of two hundred miles from the baselines from which the breadth of the territorial sea of Canada is measured, whichever is greater.

3. OPERATING LICENCE, PROGRAM APPROVAL AND NOTICES

Before undertaking any geophysical/geological work on Canada lands, the operator must obtain an Operating Licence and a program approval, and provide notice to specified federal agencies. For work within the Yukon and Northwest Territories, the operator must also obtain a Land Use Permit. Each of these requirements is discussed below.

(A) Operating Licence. Each person who plans to conduct any activity related to the exploration for, or the production of, oil and gas must obtain an operating licence issued under the Canada Oil and Gas Act. The licence may be obtained from:

Mr. T. Stalinski
Liaison Officer
The Canada Oil and Gas Lands Administration
P. O. Box 2638, Station "M"
Calgary, Alberta
T2P 3C1

or from:

Director-General
Engineering Branch
The Canada Oil and Gas Lands Administration
355 River Road
Ottawa, Ontario
K1A 0E4

The term of the operating licence is one year, dated from April 1, and the annual fee is currently $25.00.

(B) Program Approval. The Operator must obtain written authorization for any proposed work or activity on Canada lands. Application must be made 45 days in advance of the proposed commencement date for an offshore program, and 15 days in advance for an onshore program. Authorization is initiated by submitting to the Director-General, Resource Evaluation Branch, C.O.G.L.A., the material listed below.

- Three copies of the form "Application to Conduct a Geophysical/Geological Program on Canada Lands" (see reduced copy on opposite page).
- Written confirmation that the other concerned federal agencies as listed on pages 10 through 13 have been notified.
- Two copies of maps showing the position of the proposed program and lines in relation to existing geophysical/geological control in the area and the land holdings to which the program applies.
- Two copies of a page-size plat showing the location of the program area in relation to adjacent coastlines or provincial/territorial boundaries.
- Written confirmation that a Land Use Permit, if required, has been obtained.

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SCHEDULE
Form A

East Coast: - Nova Scotia
- Newfoundland
- Gulf
West Coast
Northern
Hudson Bay

APPLICATION TO CONDUCT A GEOPHYSICAL/GEOLOGICAL PROGRAM ON CANADA LANDS

Operator: .....
Operating Licence No.: .....
Geographical area: .....
Exploration agreement, provisional lease or production licence to which this program applies: .....

Program

Type of work (check and provide details):
Exclusive Non exclusive
Estimated number of kilometres (geophysical work), wells studied or field location studied (geological work): .....
Program area (attach program maps): .....
Estimated dates: Commencement: ..... Completion: .....
Estimated expenditures, on/off exploration agreement; provisional lease, production licence:
Field work On: ..... Off: .....
Data Processing On: ..... Off: .....
Interpretation/Laboratory studies On: ..... Off: .....
Data acquisition equipment: .....
Vessel, aircraft: ..... Attach specifications
Energy source: .....
Source parameters: .....
Detector parameters: .....
Number of persons employed: .....
Contractors: .....
Data acquisition: .....
Name: .....
Address: .....
Data processing: .....
Name: .....
Address: .....
Data interpretation or laboratory studies: .....
Name: .....
Address: .....

I understand that: (i) for the field work involved, the requisite advance notice in writing must be provided to other governmental agencies; (ii) for field work in the Yukon and Northwest Territories, the appropriate permits such as land use permits must be obtained; and (iii) a weekly progress report on the program must be provided to COGLA.

Signed: .....
(Responsible officer)
Title: .....
Name: ..... Company: .....
Date: ..... Phone: .....

Authorization

Conditions of Approval: .....
Signed: .....
Minister
Date: ..... Program No.: .....

..... Resources Evaluation
..... Engineering
..... Environment
..... Land Management
..... Canada Benefits
....

Department of Energy Mines and Resources | Department of Indian Affairs and Northern Development

Canada

Administration du pétrole et du gaz des terres du Canada | Canada Oil and Gas Lands Administration

ANNEXE
Formule A

Côte est: - Nouvelle-Écosse	☐
- Terre-Neuve	☐
- Golfe	☐
Côte ouest	☐
Nord	☐
Baie d'Hudson	☐

DEMANDE POUR MENER UN PROGRAMME GÉOPHYSIQUE OU GÉOLOGIQUE SUR LES TERRES DU CANADA

Exploitant: .....
Licence d'opérations n°: .....
Aire géographique: .....
Accord d'exploration, concession provisoire ou licence de production auquel ce programme s'applique: .....

Programme

Genre de travail (cocher et donner les détails):
exclusif ..... non exclusif .....
Nombre estimatif de kilomètres (travaux géophysiques), puits étudiés ou études sur le terrain (travaux géologiques): .....
Surface visée (annexer les cartes): .....
Dates projetées: Début: ..... Fin: .....
Dépenses projetées sur ou hors des territoires visés par l'accord d'exploration; la concession provisoire; la licence de production: .....
.....

Travaux sur le terrain	Sur:	Hors: .....
Traitement des données	Sur:	Hors: .....
Interprétation/Travaux de laboratoire	Sur:	Hors: .....

Équipement pour l'acquisition des données: .....
Bateaux, avions: ..... Spécifications annexées
Source d'énergie: .....
Paramètres de la source: .....
Paramètres des détecteurs: .....
Nombre d'employés: .....
Entrepreneurs: .....
Acquisition des données: .....
Nom: .....
Adresse: .....
Traitement des données: .....
Nom: .....
Adresse: .....
Interprétation des données ou des études de laboratoire: .....
Nom: .....
Adresse: .....

Je comprends que: (i) pour les travaux sur le terrain, d'autres organismes gouvernementaux peuvent exiger un avis écrit au préalable; (ii) pour des travaux sur le terrain dans les territoires du Yukon et du Nord-Ouest, les permis requis comme le permis d'utilisation des terres doivent être obtenus; et (iii) un rapport hebdomadaire des progrès du programme doit être fourni à l'APGTC.

Signé par: .....
(Responsable)
Titre: .....
Nom: ..... Compagnie: .....
Date: ..... Téléphone: .....

Autorisation

Conditions d'autorisation: .....
Signé par: .....
Ministre
Date: ..... Programme n° .....

..... Évaluation des ressources
..... Technique
..... Environnement
..... Gestion foncière
..... Retombées au Canada

Ministère de l'Énergie des Mines et des Ressources | Ministère des Affaires indiennes et du Nord canadien | Canada

- Vessel specifications must include the vessel's name, construction, registry and ownership, safety and lifesaving equipment and the navigation system. After the completed form has been signed by the Chief Conservation Officer and returned to the operator, it is recognized that the necessary approval to conduct the program has been granted.

A Project Number will be assigned to each program for identification purposes, and should be quoted by the operator in all subsequent references to this program.

The term of the program approval is from the date of commencement of field operations until the field work is completed. There is no charge for this approval.

(C) Land Use Permit. Before onshore programs in the Yukon and Northwest Territories may be approved, the operator must have obtained a Land Use Permit issued under the Territorial Lands Act. Terms and conditions may be specified on the permit which pertain to details of the field operation. Applications should be made well in advance (60-90 days) of the proposed commencement date.

Copies of the Land Use Application Form and further information on obtaining a Land Use Permit can be obtained from one of the following: (Refer to the map on the following page for area definitions)

AREA	MAILING ADDRESS
Fort Smith Keewatin Baffin Fort Simpson	Regional Manager Land Resources Northern Affairs Program Department of Indian and Northern Affairs P. O. Box 1500 Yellowknife, N.W.T. X1A 2R3 Telephone: 920-8165
Yellowknife Arctic Islands	District Superintendent Yellowknife District Northern Affairs Program Department of Indian and Northern Affairs P. O. Box 2550 Yellowknife, N.W.T. X1A 2P8 Telephone: 920-8256
Inuvik	District Manager Inuvik District Northern Affairs Program Department of Indian and Northern Affairs P. O. Box 2100 Inuvik, N.W.T. X0E 0T0 Telephone: 979-3361

LAND USE PERMIT ADMINISTRATION AREAS

Yukon Territory

Regional Director
Northern Affairs Program
Department of Indian
and Northern Affairs
200 Range Road
Whitehorse, Yukon
Y1A 3V1

Telephone: 668-5151

(D) Advance Notice to Specified Federal Departments, Agencies

The operator is responsible for providing advance notice of proposed geophysical/geological programs to certain federal departments and agencies specified below at least 45 days in advance of the proposed commencement date.

(a) Offshore Programs

- for East Coast, Arctic, and Beaufort Offshore Programs:

  Commander, Maritime Command
  Headquarters
  Maritime Command Sea Operations
  FMO Halifax, Nova Scotia
  B3K 2X0

  Phone: (902) 426-4026
  Telex: 019-21789

- for West Coast Offshore Programs:

  Commander, Maritime Forces Pacific
  Maritime Forces Pacific Surface
  Operations
  FMO Victoria, British Columbia
  V0S 1B0

  Phone: (604) 388-1167
  Telex: 004-8245

- Director,
  Aids and Waterways Branch
  Ministry of Transport
  Ottawa, Ontario
  K1A 0N7

  Phone: (613) 996-7113

- Regional Director
  Environmental Protection Service
  Department of the Environment

  At the appropriate location:

  (i) East Coast:

  - Atlantic Region
    45 Alderney Drive, 5th Floor
    Dartmouth, Nova Scotia
    B2Y 2N6

    Phone: (902) 426-3593

  (ii) West Coast:

  - Capilano 100
    Park Royal South
    West Vancouver, B.C.
    V7T 1A2

    Phone: (604) 666-6711

  (iii) North of 60° and Hudson Bay

  - West-North Region
    9942 - 108 St., 8th Floor
    Edmonton, Alberta
    T5K 2J5

    Phone: (403) 420-2570

- Fisheries Management
  Department of Fisheries and Oceans

  At the appropriate location:

  (i) for the Scotian Shelf, Bay of Fundy:

  - Box 550
    Halifax, Nova Scotia
    B3J 2S7

    Phone: (902) 426-3929
    Telex: 019-21891

  (ii) for Gulf of St. Lawrence:

  - Box 5030
    Moncton, New Brunswick
    E1C 9B6

    Phone: (165) 758-9044

(iii) for Grand Banks, Labrador Shelf:

- Box 5667
  St. John's, Newfoundland
  A1C 5X1

  Phone: (709) 737-4409

(iv) for Hudson's Bay and North of 60°N:

- Resource Assessment
  Co-ordinator
  510 University Crescent
  Winnipeg, Manitoba
  R3T 2N6

  Phone: (204) 269-7379
  Telex: 07-57419

(v) for West Coast:

- Head, Habitat Management
  Division
  1090 W. Pender Street,
  3rd Floor
  Vancouver, British Columbia
  V6E 2P1

  Phone: (604) 666-3282

- Head, Operations (Hudson Bay programs only)
  Facilities Branch
  Canadian Centre for Space Science
  National Research Council of Canada
  Ottawa, Ontario
  K1A 0R6

  Phone: (613) 996-5836

- If the proposed exploratory work is to be undertaken in Canadian waters by foreign vessels, the operator or importing company must advise:

  International Traffic Programs
  Division
  Customs and Excise
  Department of National Revenue
  Ottawa, Ontario
  K1A 0L6

  Phone: (613) 992-0693

For this purpose, Canadian Waters are defined to include all inland seas and bays, and all offshore areas adjacent to the coast of Canada extending offshore for a distance of 12 nautical miles.

- If the operator plans to use chemical explosives as a seismic source, then the appropriate Regional Director of Fisheries as listed above should be given written notice 90 days in advance of the proposed commencement date.

(b) Onshore Programs

During the process of issuing a Land Use Permit (page 7), the Department of Indian and Northern Affairs ensures that all concerned agencies are notified.

4. NOTICE OF: PURCHASE, TRADE OR REPROCESSING OF GEOPHYSICAL DATA; GEOLOGICAL STUDY; OR GEOCHEMICAL STUDY

For work or expenditures which are an obligation specified in an Exploration Agreement and which do not involve field work on Canada lands, the operator must

complete an "Application to Conduct a Geophysical/ Geological Program on Canada Lands" form (Pages 5, 6), in advance of making the transaction or study. After this form has been signed by the Chief Conservation Officer and returned to the operator, it is recognized that the necessary approval has been granted to use the work or expenditure to fulfill an obligation under an Exploration Agreement.

Applications involving the purchase, trade or reprocessing of data should make reference to the project number under which the data was originally acquired.

5. APPROVALS FOR PARTICIPATION SURVEYS

Expenditures for non-exclusive surveys or participation surveys will be eligible for application to those Exploration Agreements considered to benefit from the work. Prior to the commencement of a participation survey, the operator must obtain approval from the Resource Evaluation Branch in the normal fashion as described in Section 3 using the form, "Application to Conduct a Geophysical/Geological Program on Canada Lands" (Pages 5, 6). The estimated costs for acquisition, processing and interpretation must be identified separately. This approval

authorizes the undertaking of the survey and acknowledges that the data acquired may be utilized by interest holders as allowable work towards obligations under Exploration Agreements.

Upon the completion of the participation survey, the operator must submit a final "Statement of Expenditures with Statutory Declaration" showing the actual field costs involved, with any processing or interpretation costs indicated separately.

An interest holder wishing to purchase all or part of the data generated by a participation survey must submit his own "Application to Conduct a Geophysical/Geological Program on Canada Lands" (Pages 5, 6) in triplicate, (making cross-reference to the operator's Program Number), along with maps showing the lines purchased and identifying the lands to which it is desired that the work credits be applied. Approval of this will constitute approval-in-principle for the allocation of the work credits to those lands deemed to benefit from the survey. Each interest holder must submit a "Statement of Expenditures and Statutory Declaration" showing the actual purchase price of the data. Both the operator's and purchaser's Program Numbers must be quoted.

Both the operator and interest holder are required to submit geophysical reports as described in items 7.(a) through 7.(j) inclusive. The interest holder, in connection with each purchase, is to submit three copies of information described in paragraphs 7.(k) through 7.(n). If any re-processing has been done, this should be reported according to the specification in 7.(g).

6. REPORT REQUIREMENTS DURING FIELD OPERATIONS

(a) Weekly Progress Reports. During the course of field operations, the operator is responsible for submitting telex reports or written reports at the time of commencement and termination of the program and at weekly intervals while the program is in progress. The weekly reports should be directed to:

Director-General
Resource Evaluation Branch
Canada Oil and Gas Lands Administration
355 River Road
Ottawa, Ontario
K1A 0E4

Telex: 053-4366, Answerback: EMR RMB OTT

These progress reports may be sent by the prime contractor under direction from the operator.

However, the Director-General, Resource Evaluation Branch, must be notified of the person responsible for the reports prior to the commencement of the survey.

The weekly report should include the:

- program number assigned by COGLA;
- period covered by the report;
- name of the operator or permittee;
- latest known position of the vessel involved;
- line-kilometres shot to date and the number remaining to be shot;
- line-kilometres drilled and dozed in the case of onshore programs;
- significant dates such as commencement, suspension, recommencement and completion of field work;
- downtime due to weather, equipment failures, technical difficulties, etc.; and
- next work assignment for the vessel, if known.

(b) Reporting of Significant Events. Major accidents, serious injuries or loss of life, the sighting of an oil spill, or significant changes in the program must be reported immediately to the appropriate officer listed below:

D. F. Sherwin — Office: (613) 993-3760
Director-General — Residence: (613) 592-2980
Resource Evaluation Branch

or

L. V. Brandon
Director-General
Engineering Branch
Office: (613) 993-3760
Residence: (613) 733-8727

or

M. Ruel
Director-General
Environmental Protection Branch
Office: (613) 993-3760
Residence: (613) 225-7954

Any significant event occurring must also be reported to the manager of the appropriate regional office, as listed below:

W. Potter
Director-General
COGLA - Nova Scotia
P.O. Box 2067
Halifax, Nova Scotia
B3J 2Z1
Office: (902) 426-8570
Residence: (902) 435-1846
Telex: 019-31557

or

D. Strong
Regional Manager
Labrador Shelf
Grand Banks
and Northeast Nfld.
Canada Oil and Gas
Lands Administration
354 Water Street
P. O. Box 127
St. John's, Newfoundland
A1C 5H5
Office: (709) 737-2125
Residence: (709) 364-3484
Telex: EMR SNF (016-4031)
Telecopier: (709) 737-2127

or

M. Thomas
Regional Manager
Canada Oil and Gas
Lands Administration
P.O. Box 1500
Yellowknife, N.W.T.
X1A 2R3
Telex: 0344-5570
Telephone: (403) 920-8179

(c) Inspection Visits. On-site inspection visits may be undertaken by authorized officers of COGLA.

The operator is expected to furnish assistance to the officer as required.

7. GEOPHYSICAL REPORTS

The operator is required to submit a final geophysical report to the Director-General, Resource Evaluation Branch, C.O.G.L.A., within twelve months following the termination of the field work. The report must be submitted in triplicate and contain the information described below. There should be an explanatory note in the text of the report under the appropriate heading pertaining to any of the required information which does not exist; which will not become available; or which is not applicable to this survey.

The contents and suggested format of a final geophysical report are as follows:

(a) Title page, which indicates:

- Program number (as assigned by COGLA);
- operator's report name;
- type of survey;
- survey locality;
- year of field work;
- name of operator and interest holder;
- name of prime contractor;
- specific Exploration Agreement(s) involved;
- name of author or person responsible for the report; and
- report date.

(b) Table of Contents, List of Enclosures

(c) Introduction or Abstract

(d) Locality Map, preferably page size, which indicates the location of the survey with respect to the Exploration Agreement(s) involved and latitude/longitude co-ordinates.

(e) Statistical Summary, which includes:

- mobilization/demobilization dates;
- significant dates, such as commencement, suspension, recommencement, termination;
- number of technical and non-technical personnel, and their nationality;
- production data, including total distance surveyed, time lost and daily production;
- summary of conditions pertaining to weather, terrain, ice conditions or sea-state; and
- summary of factors which caused significant downtime.

(f) Description of the data acquisition equipment and field procedures including:

(i) description of all components of the positioning system, with estimates of accuracy and repeatability;

(ii) description of all vessels or aircraft, including ownership and flag of registry;

(iii) description of the energy source, including source array geometry;

(iv) description of the detector equipment, including detector array geometry;

(v) description of the recording system;

(vi) description of the on-board processing facility;

(vii) description of recording parameters; such as, shot or sweep interval, station interval, sampling rate, recording filter settings, aircraft elevation;

(viii) description of refraction field work for weathering corrections in the case of vibrator surveys.

(g) Description of the geophysical data processing, including:

(i) for seismic reflection data, a description of processing procedures applied to the data, such as:

- gain recovery;
- bandpass filter;
- mute pattern;
- type of deconvolution, decon parameters;
- type of velocity analysis, distance between analyses, picking method;
- stacking velocities used if not listed on section labels;
- static correction method and parameters;
- migration method and parameters;
- time amplitude display method, length and application of scaling operations;
- percent of CDP stack;
- any special processing or display techniques.

(ii) for gravity data, describe:

- all corrections applied to the data;
- any smoothing operations;
- method of correcting data discrepancies at line intersections;

- method of spatial filtering the data;
- method of gravity modelling.

(iii) for magnetic data, describe:

- all corrections applied to the total field data;
- correction for diurnal;
- correction with regional field, such as IGRF or other regional field;
- method of spatial filtering;
- method of correcting data discrepancies at line intersections;
- method of magnetic modelling.

(h) Seismic shotpoint maps, gravity station maps, track plots and flight lines with numbered fiducial points, which are on a working scale and show this geophysical data in relation to the previous data in the area.

(j) One copy on pre-folded paper and one film copy of each fully processed seismic section, including all versions with special processing or reprocessing, for all seismic lines recorded (seismic depth sections should always be accompanied by the corresponding time sections). Submission of the sections in triplicate is <u>not</u> required.

(k) Bathymetry maps

(l) Interpretive maps appropriate to the type of

survey, which indicate the interpretation of data from this survey and all previous surveys, as follows:

- for seismic reflection surveys all maps displaying time structure, depth structure, isopach, isochron, velocity, seismic amplitude and character change;

- for gravity surveys all maps displaying total gravity field, Bouguer gravity, residual gravity field, and, if maps were not made, individual gravity profiles with sufficient annotation for interpretation;

- for magnetic surveys all maps displaying total magnetic intensity, corrected total field, residual magnetic field, and, if maps were not made, individual profiles with sufficient annotation for interpretation.

(m) Any related interpretative information such as synthetic seismograms or seismic modelling studies.

(n) Written discussion of the maps and section including geological/geophysical correlations, correlations between gravity, magnetic and

seismic data, details of corrections or adjustments applied to the data during interpretation, examples of correlated seismic sections which illustrate the interpretive technique for structural and stratigraphic interpretation, and any velocity information used for time-to-depth conversion.

8. REPORTING REQUIREMENTS FOR 3-D SURVEYS

In addition to the requirements specified in Section 7, the following information is required for 3-D seismic surveys:

(a) positioning methods and an estimate of accuracy and repeatability;

(b) methods for estimating the streamer position;

(c) methods of velocity analysis, static derivation and application, and migration;

(d) methods of grouping the data within the data volume;

(e) method of interpolation for cross-lines and crooked lines;

(f) paper copies of all horizontal time slice sections, including those with special display options, such as instantaneous phase, frequency and amplitude;

(g) one copy of the movie including both vertical and horizontal sections;

(h) all interpretive maps;

(i) one paper and one film copy of all crooked lines and cross-lines.

9. REPORTING REQUIREMENTS FOR SEABED INVESTIGATION SURVEYS

Information pertaining to requirements for seabed investigation surveys at offshore wellsites are given in the COGLA publication "Drilling for Oil and Gas on Canada Lands," Appendix G.

The reporting requirements outlined in Section 7 of this publication also apply to seabed investigation surveys. Particular emphasis should be directed to the identification of any potential hazardous conditions that may affect the safety of drilling operations. The report must include a description and copy of all seabed photographs, with their respective location, and a description of all seabed samples.